Angle from direction of maximum gain, in vertical plane, above antenna (degrees)	Antenna discrimination pattern (dB)
0	Gmax
2	Not to Exceed Gmax −14
8 to 180	Not to Exceed Gmax −25

Where: Gmax is the maximum gain of the base station antenna in dBi.

(b) Applicants for an ancillary terrestrial component in these bands must demonstrate that ATC mobile terminals shall:

(1) Observe a peak EIRP limit of 1.0 dBW in 1.23 MHz.

(2) Limit out-of-channel emissions at the edge of a MSS licensee's selected assignment to an EIRP density of −67 dBW/4 kHz.

(3) Not exceed an EIRP in the 1559–1610 MHz band of −70 dBW/MHz for wideband emissions and −80 dBW in the 1559–1605 MHz band for narrow-band emissions (discrete emissions of less than 700 Hz bandwidth). The wideband EIRP level is to be measured using a root mean square (RMS) detector function with a resolution bandwidth of 1 MHz or equivalent and the video bandwidth is not less than the resolution bandwidth. The narrowband EIRP level is to be measured using an RMS detector function with a resolution bandwidth of 1 kHz or equivalent. The measurements are to be made over a 20 millisecond averaging period when the mobile terminal is transmitting.

(c) For ATC operations in the 2000–2020 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On any frequency within the 2000 to 2020 MHz band outside the licensee's frequency band(s) of operations, emissions shall be attenuated by at least 43 + 10 log (P) dB.

(2) Emissions on frequencies lower than 1995 MHz and higher than 2025 MHz shall be attenuated by at least 70 + 10 log P. Emissions in the bands 1995–2000 MHz and 2020–2025 MHz shall be attenuated by at least a value as determined by linear interpolation from 70 + 10 log P at 1995 MHz or 2025 MHz, to 43 + 10 log P dB at the nearest MSS band edge at 2000 MHz or 2020 MHz respectively.

(3) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, in its discretion, require greater attenuation than specified in paragraphs (c)(1) and (2) of this section.

(4) Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater.

NOTE TO §25.252: The preceding rules of §25.252 are based on cdma2000 system architecture. To the extent that a 2 GHz MSS licensee is able to demonstrate that the use of a different system architecture would produce no greater potential interference than that produced as a result of implementing the rules of this section, an MSS licensee is permitted to apply for ATC authorization based on another system architecture.

[68 FR 33651, June 5, 2003]

§ 25.253 Special requirements for ancillary terrestrial components operating in the 1626.5–1660.5 MHz/1525–1559 MHz bands.

(a) An applicant for an ancillary terrestrial component in these bands shall:

(1) Implement the maximum available power control for all ATC base stations and mobile terminals under GSM 800 or GSM 1800 standard (dynamic range of 30 dB in steps of 2 dB).

(2) Implement a variable rate vocoder in the ATC mobile terminal such that the duty cycle of the mobile terminal is reduced when the EIRP of the mobile terminals requested by the power control system is increased above a nominal −7.4 dBW. The duty cycle will be reduced by refraining from transmitting on consecutive time slots. The duty cycle of the mobile terminal, as measured over a 0.25 second period, shall comply with the following schedule:

Nominal mobile terminal peak EIRP	Mobile terminal transmit duty cycle (percent)
Equal to or less than −7.4 dBW	100
Greater than −7.4 dBW	50
Greater than −4.4 dBW	25
Greater than −1.4 dBW	20
Greater than −0.4 dBW	18.2

(3) Implement the provisions of paragraph (a)(2) of this section in a manner that precludes other ATC mobile terminals from using the open time slots.

(4) Demonstrate, at the time of application, how the ATC network will comply with the requirements of paragraphs (a) and (b)(1) through (b)(3) of this section.

(5) Demonstrate, at the time of application, how its ATC network will comply with the requirements of footnotes US308 and US315 to the table of frequency allocations contained in §2.106 of this chapter regarding priority and preemptive access to the L-band MSS spectrum by the aeronautical mobile-satellite en-route service (AMS(R)S) and the global maritime distress and safety system (GMDSS).

(6) Demonstrate how its ATC network base stations and mobile terminals will comply with the Global Mobile Personal Communications by Satellite (GMPCS) system requirements to protect the radionavigation satellite services (RNSS) operations in the allocation above 1559 MHz.

(7) Coordinate with the terrestrial CMRS operators prior to initiating ATC transmissions when co-locating ATC base stations with terrestrial commercial mobile radio service (CMRS) base stations that make use of Global Positioning System (GPS) time-based receivers.

(8) Demonstrate that the cellular structure of the ATC network design includes 18 dB of link margin allocated to structural attenuation. If less structural attenuation is used, the maximum number of base stations permitted under paragraph (c) of this section must be reduced or a showing must be made that there would be no increase in interference to other MSS operators and that the applicant's satellite would continue to meet the other requirements of this section.

(b) ATC base stations shall not exceed an out-of-channel emissions measurement of −57.9 dBW/MHz at the edge of a MSS licensee's authorized and internationally coordinated MSS frequency assignment.

(c) The maximum number of base stations operating in the U.S. on any one 200 kHz channel shall not exceed 1725. During the first 18 months following activation for testing of the first ATC base station, the L-band ATC operator shall not implement more than 863 base stations on the same 200 kHz channel. L-band ATC operators shall notify the Commission of the date of the activation for testing of the first ATC base station and shall maintain a record of the total number of ATC base stations operating in the U.S. on any given 200 kHz of spectrum. Upon request by the Commission, L-band ATC operators shall provide this information to resolve any claim it receives from an L-band MSS operator that ATC operations are causing interference to its MSS system.

(d) Applicants for an ancillary terrestrial component in these bands must demonstrate that ATC base stations shall not:

(1) Exceed peak EIRP of 19.1 dBW, in 200 kHz, per carrier with no more than three carriers per sector;

(2) Exceed an EIRP toward the physical horizon (not to include man-made structures) of 14.1 dBW per carrier in 200 kHz;

(3) Locate any ATC base station less than 470 meters from all airport runways and aircraft stand areas, including takeoff and landing paths;

(4) Exceed an aggregate power flux density level of −73.0 dBW/m^2/200 kHz at the edge of all airport runways and aircraft stand areas, including takeoff and landing paths;

(5) Locate any ATC base station less than 1.5 km from the boundaries of all navigable waterways or the ATC base stations shall not exceed a power flux density level of −64.6 dBW/m^2/200 kHz at the water's edge of any navigable waterway;

(6) Exceed a peak antenna gain of 16 dBi;

(7) Exceed an EIRP in the 1559–1605 MHz band of −70 dBW/MHz for wideband emissions and −80 dBW for

narrowband emissions (discrete emissions of less than 700 Hz bandwidth). The ATC station shall not exceed an EIRP in the 1605–1610 MHz frequency range that is determined by the linear interpolation from −70 dBW/MHz at 1605 MHz to −10 dBW/MHz at 1610 MHz for wideband emissions. The wideband EIRP level is to be measured using a root mean square (RMS) detector function with a resolution bandwidth of 1 MHz or equivalent and the video bandwidth is not less than the resolution bandwidth. The narrowband EIRP level is to be measured using an RMS detector function with a resolution bandwidth of 1 kHz or equivalent. The measurements are to be made over a 20 millisecond averaging period when the base station is transmitting.

(e) Applicants for an ancillary terrestrial component in these bands must demonstrate, at the time of the application, that ATC base stations shall use left-hand-circular polarization antennas with a maximum gain of 16 dBi and overhead gain suppression according to the following:

Angle from direction of maximum gain, in vertical plane, above antenna (degrees)	Antenna discrimination pattern (dB)
0	Gmax
5	Not to Exceed Gmax −5
10	Not to Exceed Gmax −19
15 to 30	Not fo Exceed Gmax −27
30 to 55	Not to Exceed Gmax −35
55 to 145	Not to Exceed Gmax −40
145 to 180	Not to Exceed Gmax −26

Where: Gmax is the maximum gain of the base station antenna in dBi.

(f) Prior to operation, ancillary terrestrial component licensees shall:

(1) Provide the Commission with sufficient information to complete coordination of ATC base stations with Search-and-Rescue Satellite-Aided Tracking (SARSAT) earth stations operating in the 1544–1545 MHz band for any ATC base station located either within 27 km of a SARSAT station, or within radio horizon of the SARSAT station, whichever is less.

(2) Take all practicable steps to avoid locating ATC base stations within radio line of sight of MAT receive sites in order to protect U.S. MAT systems consistent with ITU–R Recommendation ITU–R M.1459. MSS ATC base stations located within radio line of sight of a MAT receiver must be coordinated with the Aerospace and Flight Test Radio Coordinating Council (AFTRCC) for non-Government MAT receivers on a case-by-case basis prior to operation. For government MAT receivers, the MSS licensee shall supply sufficient information to the Commission to allow coordination to take place. A listing of current and planned MAT receiver sites can be obtained from AFTRCC for non-Government sites and through the FCC's IRAC Liaison for Government MAT receiver sites.

(g) Applicants for an ancillary terrestrial component in these bands must demonstrate that ATC mobile terminals shall:

(1) Be limited to a peak EIRP level of 0 dBW and an out-of-channel emissions of −67dBW/4 kHz at the edge of an MSS licensee's authorized and internationally coordinated MSS frequency assignment.

(2) Take all practicable steps to avoid ATC mobile terminals from causing interference to U.S. radio astronomy service (RAS) observations in the 1660–1660.5 MHz band.

(3) Not exceed an EIRP in the 1559–1605 MHz band of −70 dBW/MHz for wideband emissions and −80 dBW for narrowband emissions (discrete emissions of less than 700 Hz bandwidth). The ATC station shall not exceed an EIRP in the 1605–1610 MHz frequency range that is determined by the linear interpolation from −70 dBW/MHz at 1605 MHz to −10 dBW/MHz at 1610 MHz for wideband emissions. The wideband EIRP level is to be measured using a root mean square (RMS) detector function with a resolution bandwidth of 1 MHz or equivalent and the video bandwidth is not less than the resolution bandwidth. The narrowband EIRP level

is to be measured using an RMS detector function with a resolution bandwidth of 1 kHz or equivalent. The measurements are to be made over a 20 millisecond averaging period when the mobile terminal is transmitting.

NOTE TO §25.253: The preceding rules of §25.253 are based on GSM/TDMA 800 or GSM 1800 system architecture. To the extent that an L-band MSS licensee is able to demonstrate that the use of a different system architecture would produce no greater potential interference than that produced as a result of implementing the rules of this section, an MSS licensee is permitted to apply for ATC authorization based on another system architecture.

[68 FR 33651, June 5, 2003]

§25.254 Special requirements for ancillary terrestrial components operating in the 1610–1626.5 MHz/2483.5–2500 MHz bands.

(a) An applicant for an ancillary terrestrial component in these bands must demonstrate that ATC base stations shall:

(1) Not exceed a peak EIRP of 32 dBW in 1.25 MHz;

(2) Not cause unacceptable interference to systems identified in paragraph (c) of this section and, in any case, shall not exceed out-of-channel emissions of −44.1 dBW/30 kHz at the edge of the MSS licensee's authorized frequency assignment;

(3)At the time of application, that it has taken, or will take steps necessary to avoid causing interference to other services sharing the use of the 2450–2500 MHz band through frequency coordination; and

(4) Not exceed an EIRP in the 1559–1605 MHz band of −70 dBW/MHz for wideband emissions and −80 dBW for narrowband emissions (discrete emissions of less than 700 Hz bandwidth). The ATC station shall not exceed an EIRP in the 1605–1610 MHz frequency range that is determined by the linear interpolation from −70 dBW/MHz at 1605 MHz to −10 dBW/MHz at 1610 MHz for wideband emissions. The wideband EIRP level is to be measured using a root mean square (RMS) detector function with a resolution bandwidth of 1 MHz or equivalent and the video bandwidth is not less than the resolution bandwidth. The narrowband EIRP level is to be measured using an RMS detector function with a resolution bandwidth of 1 kHz or equivalent. The measurements are to be made over a 20 millisecond averaging period when the base station is transmitting.

(b) An applicant for an ancillary terrestrial component in these bands must demonstrate that mobile terminals shall:

(1) Meet the requirements contained in §25.213 to protect radio astronomy service (RAS) observations in the 1610.6–1613.8 MHz band from unacceptable interference;

(2) Observe a peak EIRP limit of 1.0 dBW in 1.25 MHz;

(3) Observe an out-of-channel EIRP limit of −57.1 dBW/30 kHz at the edge of the licensed MSS frequency assignment.

(4) Not exceed an EIRP in the 1559–1605 MHz band of −70 dBW/MHz for wideband emissions and −80 dBW for narrowband emissions (discrete emissions of less than 700 Hz bandwidth). The ATC station shall not exceed an EIRP in the 1605–1610 MHz frequency range that is determined by the linear interpolation from −70 dBW/MHz at 1605 MHz to −10 dBW/MHz at 1610 MHz for wideband emissions. The wideband EIRP level is to be measured using a root mean square (RMS) detector function with a resolution bandwidth of 1 MHz or equivalent and the video bandwidth is not less than the resolution bandwidth. The narrowband EIRP level is to be measured using an RMS detector function with a resolution bandwidth of 1 kHz or equivalent. The measurements are to be made over a 20 millisecond averaging period when the mobile terminal is transmitting.

(c) Applicants for an ancillary terrestrial component to be used in conjunction with a mobile-satellite service system using CDMA technology shall coordinate the use of the Big LEO MSS spectrum designated for CDMA systems using the framework established by the ITU in Recommendation ITU–R M.1186 ''Technical Considerations for the Coordination Between Mobile Satellite Service (MSS) Networks Utilizing Code Division Multiple Access (CDMA) and Other Spread Spectrum Techniques in the 1–3 GHz Band'' (1995). Recommendation ITU–R M.1186 is incorporated by reference. The Director